# Press Release

Stuttgart, August 10 2023

## MAHLE goes bionic: Battery cooling with the power of nature

- MAHLE learns from nature and achieves technological leap with new battery cooling plate
- Bionic structure of the cooling channels significantly improves thermodynamic performance and structural-mechanical properties
- 10 percent more cooling capacity, 20 percent less pressure loss, and more homogeneous temperature distribution
- Battery becomes more powerful, more durable and can be charged faster
- Premiere at the IAA Mobility in Munich

**Nature manages to solve challenges in the most efficient way to the greatest perfection. Using nature as a model, MAHLE has now achieved a technological leap forward with its new battery cooling plate. The group's engineers have developed a bionic structure-that is, one modeled on nature-for the cooling channels that causes the coolant to flow differently. This significantly improves the thermodynamic performance and structural-mechanical properties of the cooling plate. As a result, MAHLE was able to increase cooling performance by 10 percent and reduce pressure loss by 20 percent. As a result, the battery can be reliably and homogeneously kept within the necessary temperature window. It thus becomes more efficient and can be charged more quickly. In addition, its service life is increased. On top of this, MAHLE has reduced the amount of material used for the plate by up to 15 percent, thus saving 15 percent $CO_2$. MAHLE will present its new bionic battery cooling plate to the public for the first time at the IAA Mobility. The automotive trade fair will take place in Munich from September 4 to 10, 2023.**

"With our new battery cooling plate, we are breaking away from technical geometries and instead using natural structures, such as the coral shape-with outstanding effect for our cooling technology and great advantages in structural stability to boot," said Dr. Uli Christian Blessing, head of global development thermal management at MAHLE.

Lithium-ion batteries are very temperature-sensitive. The cell temperature should not exceed 40 degrees Celsius over longer periods - even under extreme conditions such as fast charging. At the same time, the temperature distribution across all cells must be as uniform as possible. The batteries are therefore usually cooled via flow-through plates.

In the latest development from MAHLE, the flow rate of the coolant is controlled according to demand: Especially in the case of small temperature differences between battery cells and coolant, heat transfer is improved by faster flow rates. The bionic battery cooling plate from MAHLE works so efficiently that the temperature range can be reduced by 50 percent and peak temperatures in particular can be significantly lowered. In this way, the Group makes a major contribution to the service life and performance of the expensive battery.

And the bionic structure also offers design advantages. Greater rigidity makes it possible to use the battery cooling plate with lower material thicknesses. This further improves its effectiveness. In addition, there are more degrees of freedom to enable new manufacturing processes with less energy and material input. A contribution to sustainability.

For well over a decade, MAHLE has been developing systems for cooling lithium-ion batteries for small cars through to large commercial vehicles, making it one of the pioneers in this field of technology.

**MAHLE at the IAA Mobility 2023**

The MAHLE IAA booth can be found at the Messe Munich exhibition center (Summit) in Hall A2. In addition, the technology group is presenting its new automated positioning system for wireless charging, which the group developed as part of a joint project with Siemens, in the Testing Area in Hall C2. Another demonstrator vehicle makes it possible to experience perfect air quality in the vehicle interior.

An AI comfort demonstrator shows how artificial intelligence can raise the interior comfort of a vehicle to a new level in the future. Furthermore, with E-HEALTH Charge, MAHLE presents how the sensitive lithium-ion battery can be optimally examined in the workshop, its condition assessed, and charged at the same time.

All of the company's innovations can also be experienced interactively on MAHLE's virtual trade fair stand at https://experience.mahle.com/ starting end of August.

*Note to editors: The accompanying photographic material for this press release can be found at [https://www.mahle.com/de/news-and-press/press-releases/](https://www.mahle.com/de/news-and-press/press-releases/).*

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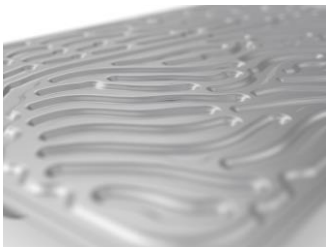
Using nature as a model, MAHLE has achieved a technological leap in a new battery cooling plate.



The new bionic cooling plate from MAHLE makes batteries more powerful and longer-lasting.

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**About MAHLE**

MAHLE is a leading international development partner and supplier to the automotive industry with customers in both passenger car and commercial vehicle sectors. Founded in 1920, the technology group is working on the climate-neutral mobility of tomorrow, with a focus on the strategic areas of e-mobility and thermal management as well as further technology fields to reduce $CO_2$ emissions, such as fuel cells or highly efficient, clean combustion engines that also run on synthetic fuels or hydrogen. Today, one in every two vehicles globally is equipped with MAHLE components.

MAHLE generated sales of more than EUR 12 billion in 2022. The company is represented with around 72,000 employees at 152 production locations and 12 major research and development centers in 30 countries. (Last revised: 12/31/2022)

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